rewritten in independent form including all of the limitations of the base claim and any intervening claims. Also, Claims 9 and 18 would be allowable if rewritten to overcome the rejections under 35 U.S.C 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

The Examiner has found Claims 3 and 16 to be duplicates of each other. Applicant has cancelled duplicate Claim 16.

Also, Claims 9, 17 and 18 are considered indefinite because they lack antecedent basis. Applicant has amended Claim 3 to provide antecedent basis regarding "means for pressurizing..." to Claim 9. Applicant has changed Claim 17 to be dependent upon Claim 15 which provides antecedent basis for "the inwardly tapered portion" recited in Claim 17. Applicant has amended Claim 11 to provide antecedent basis regarding "means for pressurizing..." to Claim 18.

Claims 6-8 and 12-14 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 6 and 12 have each been rewritten in independent form in accordance with the Examiner's guidance and should now be allowable. Because Claims 7 and 8 are dependent upon rewritten Claim 6, they also should now be allowable. Likewise, because Claims 13 and 14 are dependent upon rewritten Claim 12, they also should now be allowable.

Also, Claims 9 and 18 would be allowable if rewritten to overcome the rejections under 35 U.S.C 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims. Claims 9 and 18 have

each been rewritten in independent form in accordance with the Examiner's guidance and should now be allowable.

Claims 1-5, 10, 11, and 15-17 stand rejected as anticipated by Nedderman. Applicant respectfully traverses this rejection.

Although Nedderman appears to be similar to Applicant's present invention, it is not. Nedderman is provided with a spring loaded valve that automatically closes when polymer flow to the valve is stopped. Although the Nedderman valve opens in response to pressure of polymer flowing to it, it does not open proportionally in relationship to the pressure of the polymer flowing to it. Instead it either opens completely when polymer flows to it or it closes completely, via spring action, when polymer flow is stopped. The distinction between Nedderman and the present invention is in the proportional opening of the present valve. In column 2, beginning at line 12, the Nedderman patent teaches that an adjustable stop limits the travel of the tube and controls the size of the slot opening. Nothing in Nedderman teaches that the adjustable stop is self adjusting so that the size of the slot opening is constantly changing in proportion to the pressure of water flowing to the valve. Thus, Nedderman does not constantly adjust itself to control flow through it; it simply shuts the valve when polymer ceases to flow to the valve.

This differs from Applicant's invention which is self adjusting through a range of valve openings positions in response to the change in pressure of water flowing to the valve. The purpose behind Nedderman is to prevent back flow of water through the valve when polymer is not flowing, thereby preventing the water from contacting the polymer and thereby preventing the valve from being clogging with

the hydrating gel. The purpose behind the present invention is to constantly and automatically adjust the opening of the valve in proportion to the pressure of the water flowing to the valve. Although the present invention will close automatically when the pressure of water flowing to it exceeds the pressure that is exerted on its upstream area by the regulated pressure that is maintained in the upstream area, this is not the main purpose of the present invention. Closing of the valve is just a side benefit to its main function. That main function, as stated on page 3, beginning at line 1 of Applicant's application, is to provide a high energy mixer that automatically adjusts the nozzle size to maintain a high energy nozzle jet that will efficiently mix gel at a wide range of flow rates.

Thus with regard to independent Claims 1 and 10, Nedderman does not provide a proportional response to variations in pressure of supply water as claimed in Claim 1, dependent Claim 2, in Claim 10. Applicant has amended Claims 3 and 11 to further differentiate them from Nedderman by specifying that the upstream area is pressured with a regulated pressure and that the inner nozzle member moves in proportion to the variations in supply water pressure in the downstream area. Claims 4 and 5 are, respectively, directly and indirectly dependent upon Claim 3, and therefore the amendments to Claim 3 also apply to them. Claims 15 and 17 are, respectively, directly and indirectly dependent upon Claim 11, and therefore the amendments to Claim 11 also apply to them. Applicant has previously cancelled Claim 16.

In summary, Applicant has cancelled duplicate claim 16. Applicant has addressed the indefinite problems of Claim 9, 17 and 18 by amending Claim 3 to

provided proper antecedent basis for Claim 9, by changing Claim 17 to depend on Claim 15 that provides proper antecedent basis for Claim 17, and by amending Claim 11 so that it provides proper antecedent basis for Claim 18. Applicant has rewritten each of Claims 6, 9, 12, and 18 in independent form in accordance with the Examiner's guidance. Applicant has also traversed the anticipation rejection based on Nedderman of Claims 1-5, 10, 11, and 15-17. Applicant has amended Claims 3, 9, 11, and 17 to further differentiate the present invention from the teaching of Nedderman.

It is believed that this application is now in condition for allowance, and such action is earnestly solicited.

The Commissioner is hereby authorized to charge any additional fees to the deposit account of the undersigned, No. 13-0470.

Respectfully submitted,

Molly D. McKay, Reg. No. 35,609
3207 East 22nd Street
Tulsa, Oklahoma 74114-1823
(918) 742-5900
Attorney for Applicant

[F:\Linda's Docs\Allen, Allen\Automatically Adjusting...Amen & ROA-1]

WHAT IS CLAIMED IS:

1. (original) An automatically adjusting annular jet mixer comprising:

a stationary hollow housing, and

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing.

2. (original) An automatically adjusting annular jet mixer according to Claim 1 further comprising:

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow

supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member.

3. (currently amended) An automatically adjusting annular jet mixer according to Claim 2 further comprising:

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area ~~pressurized~~ with a ~~constant~~ regulated pressure, and said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area so that the movement of the inner nozzle member is in proportion to the variations in supply water pressure in the downstream area.

4. (original) An automatically adjusting annular jet mixer according to Claim 3 further comprising:

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening.

5. (original) An automatically adjusting annular jet mixer according to Claim 4 further comprising:

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing.

6. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 5 further~~ comprising:

a stationary hollow housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening,

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing,

a first helical groove provided in an external surface of said piston and extending between the upstream and downstream areas so that supply water flowing through the helical groove serves as a lubricant between the external surface of said piston and the inner surface of the housing as the inner nozzle member moves axially within the housing.

7. (original) An automatically adjusting annular jet mixer according to Claim 6 further comprising:

an alignment member attached to said housing at one end of the upstream area, said alignment member having an arm that extends parallel to and adjacent the inner nozzle member, and a traveling pin that inserts through a traveling pin opening provided in the arm

is retained within a groove provided in the surface of the inner nozzle member as a means of preventing the inner nozzle member from rotating within the housing as the inner nozzle member moves axially within the housing.

8. (original) An automatically adjusting annular jet mixer according to Claim 7 further comprising:

a second helical groove provided in an inner surface of said alignment member and extending between the upstream area and a drain opening that is provided extending through in the alignment member and the housing so that regulated supply water flowing through the helical groove serves as a lubricant between the inner surface of the alignment member and the external surface of the inner nozzle member as the inner nozzle member moves axially within the housing.

9. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 4 wherein the means for pressurizing the upstream area at a constant pressure further comprises~~ comprising:

a stationary hollow housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, and said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically

move axially within the housing in response to variations in supply water pressure in the downstream area,

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening, and

a pressure regulating valve providing supply water at a regulated pressure to the upstream area to pressurize the upstream area.

10. (original) An automatically adjusting annular jet mixer comprising:

a hollow stationary mixer housing, and

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a

discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member.

11. (currently amended) An automatically adjusting annular jet mixer according to Claim 10 further comprising:

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area ~~pressurized~~ with a ~~constant~~ regulated pressure, and said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in proportional response to variations in supply water pressure in the downstream area.

12. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 11 further~~ comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

a first helical groove provided in an external surface of said piston and extending between the upstream and downstream areas so

that supply water flowing through the helical groove serves as a lubricant between the external surface of said piston and the inner surface of the housing as the inner nozzle member moves axially within the housing.

13. (original) An automatically adjusting annular jet mixer according to Claim 11 further comprising:

an alignment member attached to said housing at one end of the upstream area, said alignment member having an arm that extends parallel to and adjacent the inner nozzle member, and a traveling pin that inserts through a traveling pin opening provided in the arm is retained within a groove provided in the surface of the inner nozzle member as a means of preventing the inner nozzle member from rotating within the housing as the inner nozzle member moves axially within the housing.

14. (original) An automatically adjusting annular jet mixer according to Claim 13 further comprising:

a second helical groove provided in an inner surface of said alignment member and extending between the upstream area and a drain opening that is provided extending through in the alignment

member and the housing so that regulated supply water flowing through the helical groove serves as a lubricant between the inner surface of the alignment member and the external surface of the inner nozzle member as the inner nozzle member moves axially within the housing.

15. (original) An automatically adjusting annular jet mixer according to Claim 11 further comprising:

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening.

16. (cancelled)

17. (currently amended) An automatically adjusting annular jet mixer according to Claim ~~11~~ 15 further comprising:

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing.

18. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 11 wherein the means for pressurizing the upstream area at a constant~~ regulated ~~pressure further comprises~~ comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure,

said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

a pressure regulating valve providing supply water at a regulated pressure to the upstream area as the means for pressurizing the upstream area at a regulated pressure ~~to pressurize the upstream area~~.

19. (original) A method for mixing guar gum mixtures comprising:

injecting a wetable powder through a hollow inner nozzle of an automatically adjusting annular jet mixer, and

pumping mix water into a downstream area provided in the automatically adjusting annular jet mixer between the inner nozzle and a hollow housing within which the inner nozzle axially moves so that the downstream area is pressurized and causes the inner nozzle to move relative to a housing of the mixer until the opposing forces exerted on the inner nozzle by the pressurized downstream area and an upstream area that is pressurized at a regulated pressure are balanced and thereby adjusting the nozzle opening

formed jointly by a tapered section of the inner nozzle and a inwardly tapered section of the housing so that high mixing energy is maintained to effectively wet the powder with the supply water as the supply water exits the nozzle opening, regardless of mixing rates.